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ABSTRACT

Issues concerning the teaching of sign systems to severely communicatively handicapped persons are considered. It is explained that the differences causing severe communication handicaps will affect which aspects of language processing and which aspects of language will be affected. Suggestions are made as to why some individuals who have great difficulty in acquiring spoken language might acquire sign language, e.g., the use of signs (such as rocking a baby for the word baby) which bring the referent to mind. It is concluded that teaching signed systems may be a winning effort regardless of presumed or real cognitive-linguistic limitations. (Author/PHR)

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Cognitive Considerations in the use of Signs with Persons having Severe Communicative Handicaps*

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The use of sign systems to teach language to a wide variety of handicapped persons, with whom oral language training appears to have been largely unsuccessful, has been taken up with great enthusiasm over the last five years. A recent (1977)[1] report of an examination by questionnaire of stated practices of a number of programs for retarded, autistic, aphasic, emotionally disturbed, cerebral palsied and hearing and visually impaired persons, throughout 34 states, indicated that a sizeable number of these persons (approximately 4,000) were being taught some form of sign language. It was predicted that this number would more than double shortly. The results of such efforts with these populations have yet to be evaluated in any comprehensive or even partial manner but some preliminary data and reports indicate that children who were having difficulty in acquiring words in spoken language are acquiring not only words in sign but also generating "sentences." The questions that arise from these data and reports are: why is this the case? and why only with some children? These questions are crucial ones concerning the issue of cognitive considerations in the use of signs with persons having severe communicative handicaps--the title of this talk.

My comments concerning this issue can only be highly speculative since the data crucial to resolving the issue have not been obtained. A careful review of the research that has examined proposed relations between cognitive and linguistic development indicates that no satisfactory description, much less explanation, of the cognitive capacities and competences necessary for "normal" language acquisition, be it oral or signed, is available at present.[2] What is available is some data on the language processing problems of persons who fall into the category of communicatively handicapped. I will use this "back door" approach to speculate about cognitive considerations in the use of signs. What

is known about why members of these populations are having difficulty in acquiring oral language will be examined and then suggestions will be made as to why and in what instances a sign system might circumvent or alleviate these problems.

The populations with whom these questions are germane are 1) those with central nervous system abnormalities that prevent or make very difficult normal acquisition of an oral language system, 2) those with peripheral nervous system abnormalities that prevent or make extremely difficult normal acquisition of an oral language system or 3) those with a combination of both. These categorizations are meant to imply that there are specific nervous system anomalies which prevent or make difficult normal oral language acquisition and others which do not or do so to a lesser extent. Hypothetically, these specific anomalies might affect a) the perception and/or production of oral language or b) the perception and/or production of a signed language or c) both. The children who appear to fall most neatly into category A are deaf youngsters and cerebral palsied youngsters of normal intelligence who only have difficulty in programming articulatory gestures. The former have in-put processing difficulties and the latter out-put processing difficulties. Clearly, normally developing deaf youngsters with signing parents acquire sign language in a manner similar to hearing children acquiring oral language. The problems of the cerebral palsied child with normal intelligence and hearing may be strictly limited to generating utterances not in understanding them. This also may be true of some aphasic children. In like fashion, blind children of normal intelligence would have difficulty in acquiring a "through the air" manual language and some cerebral palsied children of normal intelligence might have difficulty in programming hand articulations. However, normal "measured" intelligence is neither sufficient nor necessary for apparently normal acquisition of language. Some retarded youngsters do acquire language

in a normal manner and achieve quite sophisticated functional use of language whereas some aphasic children with normal (or above) measured intelligence on performance scales have a great deal of difficulty in achieving even smooth functional use of language. The degree of sophistication achieved in the use of language is to some extent dependent on degree of retardation and to some extent on particular language processing difficulties. For example, Curtiss, Fromkin and Yamada[3] found that one retarded youngster in a population could produce syntactically sophisticated structures but had a great deal of difficulty in comprehending such structures. Therefore, specific nervous system anomalies, regardless of measured intelligence, can prevent normal acquisition of specific aspects of oral language functioning as well as affect acquisition over-all.

One would assume that some of the language processing difficulties that have been ascribed to various retarded populations such as the mentally retarded, the autistic and retarded, the cerebral palsied and retarded, would affect both acquisition of oral and sign language. Some of the difficulties observed by Churchill[4] in lexical acquisition by autistic children such as an inability to label objects consistently across a variety of settings and exemplars, to identify multiple properties of objects and to identify shared properties in unfamiliar objects would, theoretically, also create difficulties in lexical acquisition in sign. An inability to generate utterances without modelling or prompting or without immediate feedback and reward should also affect sign language acquisition. Central processing difficulties observed by Rutter[5] and Hermelin[6] in this population such as an inability to discriminate between objects, to categorize the properties of objects and to observe relations between categories of input stimuli would prevent or make difficult the

development of rules for analysis of input stimuli and, therefore, theoretically, should affect both oral and sign language acquisition equally. Since the capacities and competences required for acquisition of any language as a language rather than as a set of memorized behaviors must be the same, then there should be persons within the category of severely communicatively handicapped who would have equal difficulty in acquiring either an oral or a signed language.

A recent critical review of research on signing behavior in apes by Seidenberg and Pettito[7] brings into sharp focus some important questions about the use of signs with cognitively limited populations. The reviewers present a highly persuasive argument that little evidence has been provided that signing apes show "linguistic" abilities. They also outline for us the kinds of evidence that would be needed to make the claim that such linguistic abilities are present. More importantly, in doing so, they also point to some of the linguistic-cognitive abilities that were outlined above as being, presumably, deficient in some populations, as simply not being evidenced by signing apes but clearly evident in children acquiring ASL. They suggest that apes have learned the consequences of signing but not the meaning of signs and conclude that "whatever the scope of their (the apes) cognitive and communicative abilities, it cannot be claimed that their behavior resembled that of children."

In summary, it is probably the case that in populations having severe communicative handicaps, even in those populations categorized as retarded, that the causes for such severe communicative handicaps will vary. This variation in cause will, in turn, affect which aspects of language processing (perception or production or both) and which aspects of language (semantic, syntactic, morphophonological and/or pragmatic) will be affected. I have also suggested that the cause of the oral language difficulties evidenced will

determine whether substitution of a sign system will circumvent or alleviate these problems or if the sign system will be equally difficult to acquire. If there are severe limitations on the learner's ability to discriminate between input stimuli to categorize such stimuli, to observe relations between categories of input stimuli and to develop rules for analysis then there should be equal difficulty in the acquisition of oral and sign language. If on the other hand, the difficulties are concerned with only aspects of language processing (input or output) and/or only some aspects of language (a component or components of the grammar) then substitution of a sign system might work well. These possibilities may account for successful teaching of sign to some members of these populations and lack of success with others. These logical conclusions, however, do not totally explain why this substitution of signed for spoken language works at all for some persons with the described cognitive-linguistic limitations.

The most obvious reason is that these cognitive limitations are exaggerated when the task is acquisition of spoken language. A case in point is, of course, deaf youngsters. I have tried to indicate that children in other populations may have difficulty in acquiring a spoken language because of specific central nervous system anomalies which block the processing of auditory-vocal information but not information in general. These may be the children who benefit most from exposure to sign language. There are others, however, who appear to be limited in all types of information processing and yet acquire some signs. This has to be accounted for. Brown has suggested that signed languages are easier to learn than spoken languages "for some organisms at particular points in their development."[8] One of the reasons presented by Brown to account for greater ease in learning is the iconicity of some signs. Examples of iconicity

given are signs which exemplify actions by or to referents that bring a referent to mind (rocking an imaginary baby for the word baby), and signs that exemplify referents (for example, spatial referents such as in, on, under or actions such as walk, run). The greater frequency of iconicity in tokens in sign language as compared to such tokens in spoken language would make the signed lexicon relatively easier to acquire. A second reason presented by Brown for signed languages being easier to learn than spoken is that the configuration of a sign can be molded. That is, the hand can be taken through the appropriate movements by another. Although a sub-set of articulatory movements can be shaped by another (lip shaping, jaw opening, etc.) there are many which cannot and clearly it is impossible to shape a sound sequence. Brown points to the fact that the Gardners found that molding Washoe's hand was the most effective technique for teaching her to produce a sign and that, although normal hearing and deaf youngsters do not benefit from molding after age 3 or 4 when visual input alone is needed, the availability of such a teaching technique can be extremely useful with "backward" children. Still another reason, not cited by Brown, for sign being easier to acquire is that some developmental data indicate that below the ages of 3 to 4 or 5 to 6 years, depending on the particular task, visual-visual associations are easier to recall than auditory-visual or auditory-auditory in some paired association tasks.[9]

These then are the reasons why some aspects of language may be easier to acquire in sign language than these same aspects in spoken language by some organisms at some particular times (i.e., early) in their development. It should be noted, however, that unless the organism has the cognitive-linguistic capacities and competences required for the acquisition of a language it is

doubtful that progress will be made beyond the acquisition of the easier to learn aspects. Studies of the structure of sign language[10] reveal that the language has conventions for marking classes and relations that are as complex as those found in any highly inflected language. Therefore, signs that may be iconic in isolation lose their iconicity when incorporated into utterances. Seidenberg and Pettito state that signing apes can learn to sign in a communicative context regardless of content because of particular consequences and can solve the problem of finding signals which are required in particular contexts. Thus, they have developed the responding strategies of 1) sign anything and 2) sign from a particular category in certain situations.

In conclusion, attempts to teach severely communicatively handicapped individuals sign language can be of benefit to these individuals, first, because some of these individuals presumed cognitive-linguistic limitations may, in fact, be wholly or in part limitations in acquisition of a spoken language or aspects of spoken language due to specific central nervous system anomalies rather than limitations in the ability to acquire language per se. In addition, such teaching can be beneficial because those individuals with severe cognitive-linguistic limitations may yet acquire some aspects of sign because this is easier to do than acquiring these same aspects in spoken language. Overall then, teaching signed systems may be a winning effort regardless of presumed or real cognitive-linguistic limitations.

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